

CLAIMS

1. A retraction device 10 adapted to temporarily reposition body tissues and organs during a surgical procedure, comprising:
 - a malleable ring member 15 comprising a plurality of bending portions 24, 25, 26, 27 adapted to be twisted, folded, bent or deformed to be inserted into a surgical incision; and
 - a membrane 60 fixedly attached around the perimeter of the ring member 15.
2. ... The retraction device of claim 1, wherein the membrane 60 is a flexible fabric operable to retain the body tissues and organs of different shapes and sizes.
3. ... The retraction device of claim 1, wherein the membrane 60 is capable to retaining both hard and soft body tissues and organs during surgery.
4. ... The retraction device of claim 1, wherein the bending portions 24, 25, 26, 27 and the membrane 60 are taut enough to securely hold and separate hard tissues and organs yet are flexible enough to gently retain soft tissues and organs so as not to damage the tissues and organs or affect their circulation.

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5. The retraction device of claim 1, wherein the membrane 60 is transparent.

6. The retraction device of claim 1, wherein the membrane 60 is sized and configured to stretch and recover to the shaping and reshaping of the ring member 15.

7. The retraction device of claim 1, wherein the membrane 60 is a bias-woven or knitted fabric.

8. The retraction device of claim 1, wherein the membrane 60 is formed of any elastic material that responds to the shaping and reshaping of the ring member 15.

9. The retraction device of claim 1, wherein the ring member 15 has an oval cross-section providing a preference for bending along the long axis.

10. The retraction device of claim 1, wherein the ring member 15 has a substantially square cross-section providing equal preference to bending in both axes or planes and resistance to bending diagonally.

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11. The retraction device of claim 1, wherein the ring member 15 has a circular cross-section.

12. The retraction device of claim 1, wherein the ring member 15 further comprises an internal lumen 56 defining a wall 57.

13. The retraction device of claim 12, wherein the wall 57 has a circular cross-section or a cross-section of any geometric shape providing a desired bending bias.

14. The retraction device of claim 12, wherein the ring member 15 further comprises a reinforcement member 315 placed within the lumen 56 to provide additional bending bias.

15. The retraction device of claim 14, wherein the reinforcement member 315 comprises at least a plastic component and a metallic component.

16. The retraction device of claim 15, wherein the metallic component includes at least one of aluminum, titanium and stainless steel.

17. The retraction device of claim 14, wherein the reinforcement member 315 is placed in some sections 28, 29 of the ring member 15 to keep said sections 28, 29 substantially straight.

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18. The retraction device of claim 14, wherein the reinforcement member 315 comprises a shape memory material including Nitinol.

19. The retraction device of claim 1, wherein the ring member 15 comprises a plurality of cords 202, 204, said cords 202, 204 are vertically joined at a point 206 along vertical axes of the cords 202, 204.

20. The retraction device of claim 19, wherein the cords 202, 204 have oval cross-sections.

21. The retraction device of claim 14, wherein the reinforcement member 315 has a first cross-section and the ring member 15 has a second cross-section different in shape from the first cross-section.

22. The retraction device of claim 21, wherein the first cross-section of the reinforcement member 315 is rectangular and the second cross-section of the ring member 15 is circular.

23. The retraction device of claim 14, wherein each of the ring member 15, the reinforcement member 315 and the wall 57 has a cross-section or a profile of any geometric shape to provide a desired bending bias in a preferred plane.

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24. The retraction device of claim 21, wherein the reinforcement member 315 imparts a different bending bias on the ring member 15.

25. The retraction device of claim 14, wherein the ring member 325 further comprises a second lumen 335 and a second reinforcement member 355 placed within the second lumen 335.

26. A method for operating a retraction device 10 adapted to reposition body tissues and organs during a surgical procedure; comprising the steps of:
providing a malleable ring member 15 having a plurality of bending portions 24, 25, 26, 27 and a membrane 60 fixedly attached around the perimeter 5 of the ring member 15; said portions 24, 25, 26, 27 adapted to be twisted, folded, bent or deformed to be inserted into a surgical incision;
inserting the ring member 15 into the surgical incision to provide an operable area; and
twisting, folding, bending or deforming the portions 24, 25, 26, 27 of the 10 ring member 15 during the surgical procedure to reposition the body tissues and organs.

27. The method of claim 26, further comprising the step of removing the ring member 15 from the operable area by twisting, folding, bending or deforming the portions 24, 25, 26, 27 and pulling them through the surgical incision after surgery.

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28. The method of claim 26, wherein the membrane 60 is a flexible fabric operable to retain the body tissues and organs of different shapes and sizes.

29. The method of claim 26, wherein the membrane 60 is capable to retaining both hard and soft body tissues and organs during surgery.

30. The method of claim 26, wherein the ring member 15 further comprises an internal lumen 56 defining a wall 57.

31. The method of claim 30, wherein the wall 57 has a circular cross-section or a cross-section of any geometric shape providing a desired bending bias.

32. The method of claim 30, wherein the ring member 15 further comprises a reinforcement member 315 placed within the lumen 56 to provide additional bending bias.

33. The method of claim 32, wherein the reinforcement member 315 comprises at least a plastic component and a metallic component.

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34. The method of claim 32, wherein the reinforcement member 315 is placed in some sections 28, 29 of the ring member 15 to keep said sections 28, 29 substantially straight.